

**REMARKS**

The title has been amended as during prosecution of the international application. The specification has been amended to reflect the national stage status. In addition, the multiple dependencies of the claims have been removed to reduce the PTO filing fee.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "**Version with markings to show changes made.**"

Favorable action on the merits is solicited.

Respectfully submitted,

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# Specification

method of Treating polyol recovered through Decomposition and  
~~Method for Processing Decomposed Reusable Polyol and~~  
 Polyol recovered through Decomposition  
~~Decomposed Reusable Polyol~~

5 This application is a 371 of PCT/JP00/05748 filed August 25, 2000.  
 Technical Field

This invention relates to a method for processing decomposed reusable polyol and decomposed reusable polyol and, more particularly, to a method for processing decomposed reusable polyol obtained by decomposing polyurethane resin and to the as-decomposed reusable polyol obtained by the processing method of the present invention.

## Background Art

In recent years, from the standpoints of global environmental conservation and resource conservation, recycling of plastic material is being desired increasingly. This applies to polyurethane resins, such as flexible polyurethane foams used as cushioning material for seats of vehicles and for furniture items and rigid polyurethane foams used as heat insulating material for houses and for refrigerators and the like. Various types of recycling methods, including a material recycling method and a chemical recycling method, are being studied and some are being put in practical use.

For example, an alkali decomposing process, a glycolysis process (a glycol decomposing process), an aminolysis process (an amine decomposing process) and a hydrolysis process are known as the chemical recycling method for polyurethane resin. The glycolysis process using low molecular weight glycol for decomposition of polyurethane resin has partly come into

equivalent of amino group of the amines in the decomposed and recovered polyol containing the amines.

7. The method for processing decomposed polyol according to Claim 1, wherein an oxide compound is added to the decomposed and recovered polyol containing the amines, thereby subjecting the amines to processing.

8. The method for processing decomposed polyol according to Claim 7, wherein the oxide compound is added to the decomposed and recovered polyol containing the amines in the presence of no catalyst.

9. The method for processing decomposed polyol according to Claim 7, wherein the oxide compound is added to the decomposed and recovered polyol containing the amines and heated at 80-140°C.

10. The method for processing decomposed polyol according to Claim 7, wherein the oxide compound is added in such a proportion that the oxide compound contains 1.5-3.0 equivalents of oxide group per equivalent of amino group of the amines in the decomposed and recovered polyol containing the amines.

11. The method for processing decomposed polyol according to Claim 1, wherein a urea is added to the decomposed and recovered polyol containing the amines, thereby subjecting the amines to processing.

12. The method for processing decomposed polyol according to Claim 11, wherein the urea is added in the proportion of 0.4-1.5 equivalents per equivalent of amino group of the amines in the decomposed and recovered polyol containing the amines.

✓ 13. <sup>Amended</sup> The method for processing decomposed polyol according to ~~any of~~ Claims ~~1, 2, 5, 7 and 11~~, wherein the decomposed and recovered polyol

containing the amines is polyoxyalkylene polyol.

✓ 14. <sup>(Amended)</sup> The method for processing decomposed polyol according to ~~any of~~  
Claims 1, ~~2, 5, 7 and 11~~, wherein the content of the amines in the  
decomposed and recovered polyol containing the amines is 5 weight. % or  
5 less.

✓ 15. <sup>(Amended)</sup> The method for processing decomposed polyol according to ~~any of~~  
Claims 1, ~~2, 5, 7 and 11~~, which is applied to a recovering process of a  
decomposing and recovering process of polyurethane resin comprising a  
hydrolyzing process for hydrolyzing the polyurethane resin and the  
10 recovering process for recovering the decomposed product produced by the  
hydrolysis.

16. A decomposed reusable polyol obtained by performing the process that  
after an organic dicarboxylic acid or anhydride thereof is added to  
decomposed and recovered polyol containing amines which is obtained by  
15 decomposition of polyurethane resin, the precipitate is removed.

17. A decomposed reusable polyol obtained by performing the process that  
an isocyanate compound is added to decomposed and recovered polyol  
containing amines which is obtained by decomposition of polyurethane  
resin.

20 18. A decomposed reusable polyol obtained by performing the process that  
an oxide compound is added to decomposed and recovered polyol containing  
amines which is obtained by decomposition of polyurethane resin.

19. A decomposed reusable polyol obtained by performing the process that  
urea is added to decomposed and recovered polyol containing amines which  
25 is obtained by decomposition of polyurethane resin.

## Claims

1. A method for processing decomposed polyol, wherein decomposed and recovered polyol containing amines obtained by decomposition of polyurethane resin is further subjected to processing to remove the amines and recover the decomposed and recovered polyol therefrom as reusable products. *no definitive steps*
2. The method for processing decomposed polyol according to Claim 1, wherein after an organic dicarboxylic acid or anhydride thereof is added to the decomposed and recovered polyol containing the amines, the precipitate is removed, thereby subjecting the amines to processing. *the acid treatment the processing*
3. The method for processing decomposed polyol according to Claim 2, wherein the organic dicarboxylic acid or anhydride thereof is oxalic acid.
4. The method for processing decomposed polyol according to Claim 2, wherein the organic dicarboxylic acid or anhydride thereof is added to the decomposed and recovered polyol containing the amines in such a proportion that the organic dicarboxylic acid or anhydride thereof contains 0.3-1.05 equivalents of carboxyl group per equivalent of amino group of the amines.
5. The method for processing decomposed polyol according to Claim 1, wherein an isocyanate compound is added to the decomposed and recovered polyol containing the amines, thereby subjecting the amines to processing. *making to*
6. The method for processing decomposed polyol according to Claim 5, wherein the isocyanate compound is added in such a proportion that the isocyanate compound contains 0.8-1.5 equivalents of isocyanate group per

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equivalent of amino group of the amines in the decomposed and recovered polyol containing the amines.

7. The method for processing decomposed polyol according to Claim 1, wherein an oxide compound is added to the decomposed and recovered polyol containing the amines, thereby subjecting the amines to processing.

8. The method for processing decomposed polyol according to Claim 7, wherein the oxide compound is added to the decomposed and recovered polyol containing the amines in the presence of no catalyst.

9. The method for processing decomposed polyol according to Claim 7, wherein the oxide compound is added to the decomposed and recovered polyol containing the amines and heated at 80-140°C.

10. The method for processing decomposed polyol according to Claim 7, wherein the oxide compound is added in such a proportion that the oxide compound contains 1.5-3.0 equivalents of oxide group per equivalent of amino group of the amines in the decomposed and recovered polyol containing the amines.

11. The method for processing decomposed polyol according to Claim 1, wherein a urea is added to the decomposed and recovered polyol containing the amines, thereby subjecting the amines to processing.

12. The method for processing decomposed polyol according to Claim 11, wherein the urea is added in the proportion of 0.4-1.5 equivalents per equivalent of amino group of the amines in the decomposed and recovered polyol containing the amines.

13. The method for processing decomposed polyol according to any of Claims 1, 2, 5, 7 and 11, wherein the decomposed and recovered polyol

13. (Amended) The method for processing decomposed polyol according to Claim 1, wherein the decomposed and recovered polyol containing the amines is polyoxyalkylene polyol.

A'  
14. (Amended) The method for processing decomposed polyol according to Claim 1, wherein the content of the amines in the decomposed and recovered polyol containing the amines is 5 weight % or less.

basis  
15. (Amended) The method for processing decomposed polyol according to Claim 1, which is applied to a recovering process of a decomposing and recovering process of polyurethane resin comprising a hydrolyzing process for hydrolyzing the polyurethane resin and the recovering process for recovering the decomposed product produced by the hydrolysis. ambiguous

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15 16. A decomposed reusable polyol obtained by performing the process that after an organic dicarboxylic acid or anhydride thereof is added to decomposed and recovered polyol containing amines which is obtained by decomposition of polyurethane resin, the precipitate is removed.

17. A decomposed reusable polyol obtained by performing the process that an isocyanate compound is added to decomposed and recovered polyol containing amines which is obtained by decomposition of polyurethane resin.

20 18. A decomposed reusable polyol obtained by performing the process that an oxide compound is added to decomposed and recovered polyol containing amines which is obtained by decomposition of polyurethane resin.

19. A decomposed reusable polyol obtained by performing the process that urea is added to decomposed and recovered polyol containing amines which  
25 is obtained by decomposition of polyurethane resin.